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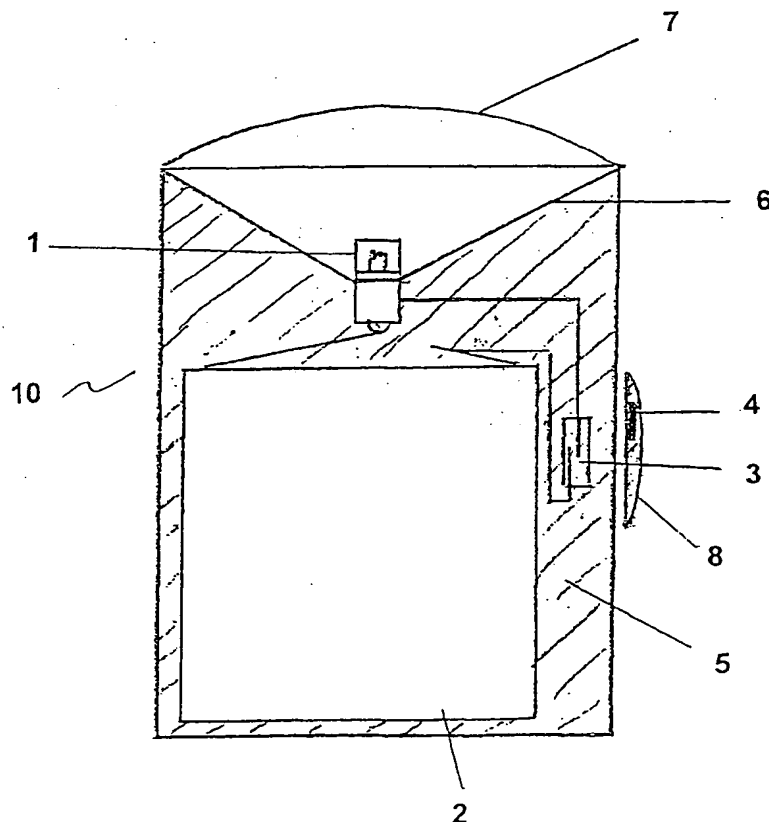
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[Continued on next page]

(54) Title: LAMP



(57) Abstract: A lamp comprises a light
source (1), a battery (2) and a switch unit
(3) which are electrically interconnected. The
lamp's reliability, wear life and corrosion
resistance are increased by the switch unit
being a magnetic switch (3), which by means
of an electrically insulating moulding material
is moulded in the same unit as the light source
(1) and the battery (2), and which is operated
externally by a movable magnet (4).

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Lamp

The invention relates to a battery-powered lamp, and especially a lamp comprising a light source, a battery and a switch unit which are electrically interconnected.

- 5 In more specific terms, the invention relates to disposable lamps for general use. The lamps are hand-held lamps, both chargeable and non-chargeable, and of different sizes.

Ordinary lamps, particularly lamps containing replaceable batteries, light
10 sources or other components, all have in common the problem that they corrode easily and are unreliable over a period of time. This is usually due to the penetration of moisture, resulting in corrosion of contacts between batteries, light source and switch. A result of this corrosion is that the lamp has to be shaken and knocked in order to make it work.

US-4 303 970 discloses a lamp of the type mentioned at the beginning, which
15 is made watertight by means of a sealed housing. The lamp also contains an elastic material, such as foam rubber. The material provides electrical and thermal insulation, but contains air, thus leading amongst other things to the risk of condensation being formed inside the lamp. Optimal protection is therefore not obtained against the formation of corrosion in the electrical
20 connections. The lamp contains a mechanical switch which is operated from the outside via sealing means around a control spindle. This represents an additional risk of penetration of air, water and vapour and of the formation of corrosion.

An object of the invention is to provide a lamp as mentioned at the beginning,
25 which is reliable, resistant in most environments, watertight, corrosion-resistant, robust, possessing long storage durability, resistant to impact, shock and other physical stresses, and having low production costs.

A special object of the invention is to provide a lamp of this kind which can
30 also be operated from outside by an operating body, where the operating body does not detract from qualities in the lamp such as reliability, resistance, watertightness, corrosion resistance, robustness and storage durability.

A further object is to provide a lamp of this kind which in addition is environmentally friendly, and/or a lamp of this kind which can be included in a return scheme.

The lamp also comprises a reflector 6 and a lamp lens 7, both of which are moulded in the same unit as the light source 1, the battery 2 and the switch unit 3.

5 Fig. 2 illustrates in cross section a second embodiment 20 of a substantially cylindrical lamp according to the invention. Identical or corresponding elements are given the same reference numerals as in fig. 1. The battery 2 in this case consists of two cylindrical cells, connected in series.

10 This embodiment 20 corresponds by and large with the embodiment 10 in fig. 1, except for the fact that the movable magnet 4 is attached to a circular ring 8 which is arranged to be rotated round the lamp. The ring 8 has an internal diameter which is slightly larger than the external diameter of the main part of the lamp, thus permitting rotation with a suitable degree of friction. When the ring 8 is rotated to a position where the magnet is located immediately above the magnetic switch 3, the lamp will be switched on. The main part of the lamp
15 is provided with slots (not shown) which are suitable for holding the ring in a fixed axial position while permitting rotating movement.

In a variant of the embodiment in figure 2, the ring 8 is arranged to be moved in a spiral, i.e. with a rotating movement with a simultaneous movement in the lamp's axial direction. This can be achieved by providing the ring with an
20 internal spiral-shaped slot, adapted to fit a fixed raised portion on the outside of the lamp's main part.

Fig. 3 is a schematic view from above of a third embodiment 30 of a miniaturised lamp according to the invention. In this case a button cell is employed for the battery 2, and for the light source 1 a light-emitting diode
25 with integrated pre-resistor. The magnetic switch 3 is operated by a movable operating body (not shown) on the outside of the lamp's moulded main part and containing a magnet (not shown).

In contrast to known lamps which are made watertight solely by means of a tightly enclosing housing, the chances of the formation of corrosion are greatly
30 reduced in the lamp according to the invention, since the moulding material fills all the cavities, thus preventing air, vapour or water from coming into contact with the electrical connection points. This feature, combined with the use of a sealed magnetic switch and a movable magnet arranged for external operation, provide a highly reliable lamp with long storage durability.
35 Furthermore, the lamp provided is extremely robust with regard to influences

PATENT CLAIMS

1. A lamp, comprising a light source (1), a battery (2) and a switch unit (3) which are electrically interconnected,
characterized in that the switch unit is a magnetic switch (3) which by means
5 of an electrically insulating moulding material (5) is moulded in the same unit
as the light source (1) and the battery (2), and which is operated externally by
a movable magnet (4).
2. A lamp as indicated in claim 1,
characterized in that all electrical connections are located in a corrosion-free
10 environment, since the moulding material (5) fills all the cavities between the
components of the lamp.
3. A lamp as indicated in claim 2,
characterized in that the movable magnet is attached to a ring which can be
rotated round the lamp.
- 15 4. A lamp as indicated in claim 2,
characterized in that the movable magnet is movably mounted on the outside of
the lamp.
5. A lamp as indicated in claim 3 or 4,
characterized in that all electrical connections are welded or soldered.
- 20 6. A lamp as indicated in claim 5,
characterized in that it also comprises a reflector (6) and a lamp lens (7)
moulded in the same unit as the light source, the battery and the switch unit.

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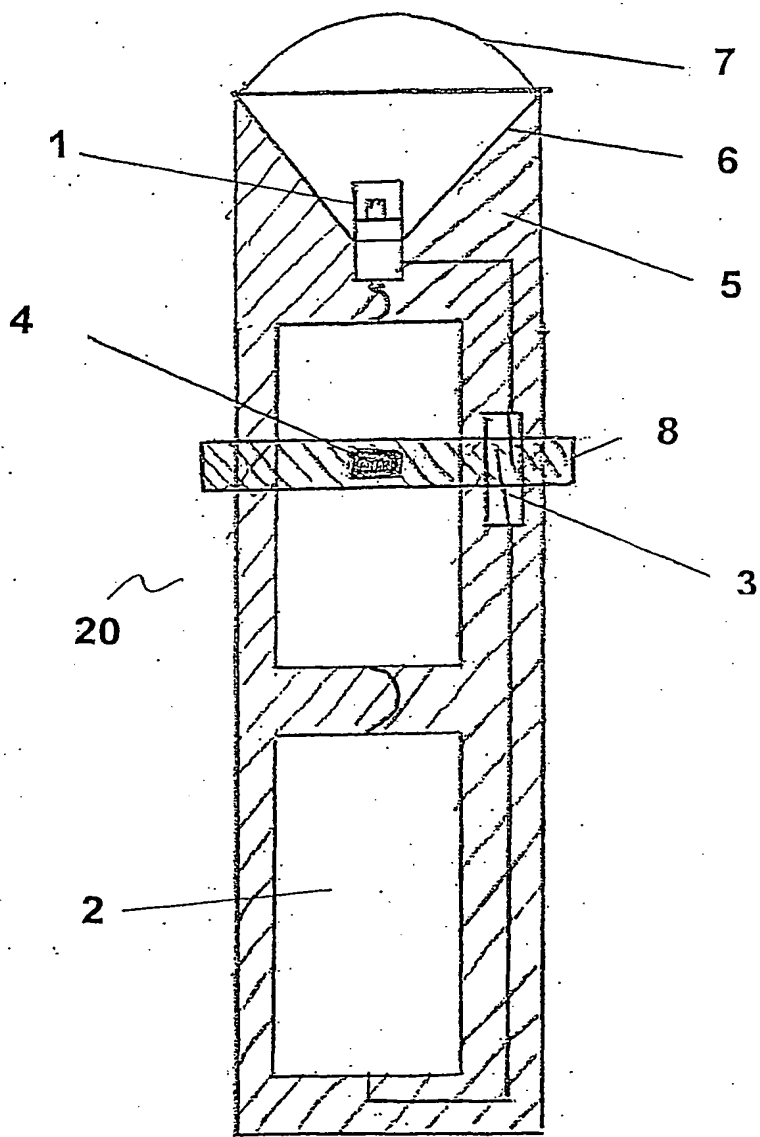


Fig. 2

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International application No.

PCT/NO 01/00260

A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: F21L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI DATA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GB 2089015 A (TANG CHUEN), 16 June 1982 (16.06.82), figure 5 --	1,2
Y	GB 2090956 A (STROBE-IDENT LIMITED), 21 July 1982 (21.07.82), page 2, line 47 - line 49; page 2, line 65 - line 79 --	1,2,4
Y	US 4303970 A (ROBERTSON), 1 December 1981 (01.12.81), figure 1, abstract --	1,2,4
Y	US 4760504 A (SCHALLER ET AL), 26 July 1988 (26.07.88), figure 2 --	1,2,4

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

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Patent document cited in search report			Publication date	Patent family member(s)	Publication date
GB	2089015	A	16/06/82	NONE	
GB	2090956	A	21/07/82	NONE	
US	4303970	A	01/12/81	NONE	
US	4760504	A	26/07/88	NONE	
US	3162376	A	22/12/64	NONE	
US	3790912	A	05/02/74	US 3792389 A	12/02/74
US	3898450	A	05/08/75	NONE	